

a second cladding forming step for depositing a second porous cladding around the vitrified core rod by vapor-phase axial deposition after the core rod stretching step;

a second cladding dehydrating step for dehydrating the second porous cladding so as to reduce an OH group concentration to 50 ppm or less by weight ratio after the second cladding forming step; and

a second cladding vitrifying step for forming the second porous cladding to be transparent and vitrified after the second cladding dehydrating step.

Brief Description of the Drawings

Exemplary embodiments of the invention will now be described in conjunction with drawings, in which:

Fig. 1 depicts an illustration showing a porous core rod producing step in one embodiment of the method of fabricating the optical fiber preform in the invention;

Fig. 2 depicts an illustration showing a stretching step in the above one embodiment;

Fig. 3 depicts an illustration showing a second porous cladding forming step in the above one embodiment;

Fig. 4 depicts a diagram illustrating the transmission loss spectra of the optical fiber obtained from the optical fiber preform fabricated in the above one embodiment; and

Fig. 5 depicts a diagram illustrating the transmission

loss spectra of the optical fiber obtained from the optical fiber preform fabricated in the above one embodiment, after the optical fiber is allowed to stand in a hydrogen atmosphere.

Detailed Description

The proposed example of the method of fabricating the optical fiber preform described above removes the OH groups on the surface of the above-mentioned porous core rod by etching the surface of the porous core rod. Therefore, the OH groups-removing process needs costs of equipment for a plasma etching apparatus, and processing costs are also increased in accordance with an increase in man-hours.

Additionally, in the optical fiber preform fabricated by applying the method of fabricating the optical fiber preform described above, a cladding having a sufficient thickness is formed by inserting the core rod into the cladding cover glass tube. Therefore, the OH group concentration of the cladding cover glass tube needs to be reduced, as the thickness of the first cladding is thinner. However, a cladding cover glass tube having a low OH group concentration is not fabricated easily.

Furthermore, in the optical fiber fabricated from the optical fiber preform obtained by applying the method of fabricating the optical fiber preform, a problem has arisen that transmission losses in the waveband of 1.36 to 1.43 μm

are increased when the optical fiber is used under a high-energy radiation environment or H_2 ion atmosphere. It is considered that the transmission loss increase is caused by the defects of peroxide radicals that have been generated in the optical fiber preform fabrication.

One aspect of the methods of fabricating the optical fiber preform and the method of fabricating the optical fiber in the invention is the fabrication methods of the optical fiber preform and method of fabricating the optical fiber capable of obtaining the following optical fiber. The optical fiber obtained by applying the invention is an optical fiber that has a small absorption peak in the waveband of 1.36 to 1.43 μm and is suitable for conducting the WDM transmission utilizing the entire wavelengths of 1.25 to 1.60 μm . Additionally, the application of the method of fabricating the optical fiber preform of the invention allows the fabrication of a large-sized optical fiber preform capable of obtaining the above-mentioned optical fiber with excellent productivity and at low costs.

Furthermore, the optical fiber fabricated by applying the method of fabricating the optical fiber of the invention can prevent the transmission loss increase in the waveband of 1.36 to 1.43 μm , even though it is used under the high-energy radiation environment and the H_2 atmosphere.

Hereafter, one embodiments of the invention will be